

***Insoluble Fiber Sources in Mash Diets for Broiler Starters (D1-21): The Impact on Growth Performance, Foregut Development, and the Utilization of Nutrients and Energy***

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Even though insoluble fiber (IF) is considered a nutrient diluent in poultry diets, the potential of IF to improve gut health by developing the chicken foregut has been recognized. A 21-day experiment evaluated the effect of IF on growth performance, nutrient, and energy utilization, and foregut organ development of broiler starters fed mash diets. Four dietary treatments were developed with a control (a commercial broiler starter diet) and three experimental diets by diluting the control diet (60 g/kg [w/w]) with three IF sources (rice hulls [RH], lentil hulls [LH], and wood shavings [WS]). A total of 120, one-day-old broilers (6 birds/cage; 5 cages/treatment) were used in a completely randomized design. No difference ( $P>0.05$ ) in growth performance parameters was observed up to d7. At d14, however, birds fed control and RH diets showed the lowest ( $P<0.05$ ) feed conversion ratio (FCR; 1.079 and 1.129, respectively). Overall, birds fed the control diet had the highest body weight gain and lowest feed intake and, consequently, the lowest FCR ( $P<0.05$ ; d1-21). Nevertheless, when corrected for the IF inclusion to consider the feed intake only, FCR was not affected by dietary treatments ( $P>0.05$ ). Feeding RH and WS improved the crop weight (g/kg of body weight;  $P<0.05$ ) compared to the control. By incorporating RH with the diet, the highest (19.2%;  $P<0.05$ ) gizzard growth compared to the control (14.58 vs 12.23 g/kg of body weight) was achieved. Birds fed RH and LH had lower ( $P<0.05$ ) gizzard pH (2.97 and 2.99, respectively) compared to those fed WS. Despite being considered a nutrient diluent, tested IF did not impair ( $P>0.05$ ) the apparent metabolizable energy and apparent ileal protein and fat digestibility. With the highest improvement in gizzard growth and consequent low gizzard pH, 60 g RH/kg diet suggested the possible manipulation of RH as a functional ingredient in broiler starter diets.

**Keywords:** Broilers, Foregut, Gizzard, Insoluble Fiber, Rice Hulls

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